St James' Catholic Primary School

Policy for Calculation

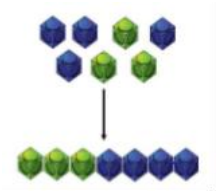
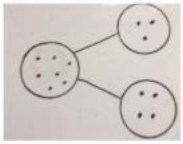
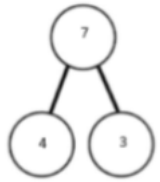
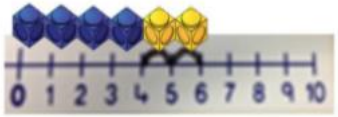
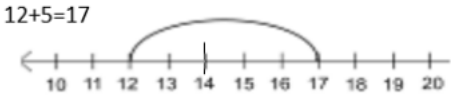
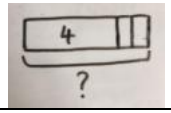
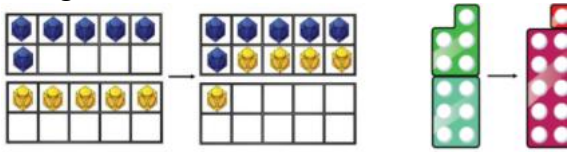
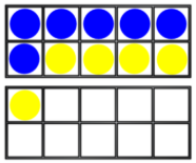
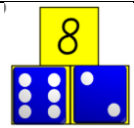
Reviewed April 2026

This policy has been largely adapted from the White Rose Maths Hub Calculation Policy with further material added. It is a working document and will be revised and amended as necessary.

Please note: To develop a secure understanding of the number system children should begin using concrete resources to develop a mental picture of the number system in their heads. They should then begin using pictorial representations to both support and demonstrate their understanding before moving onto abstract representations. Abstract representations can be used alongside concrete and pictorial but not alone when introducing a new strategy/concept.

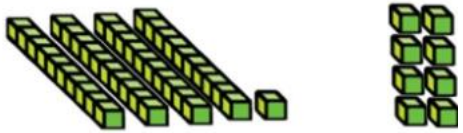
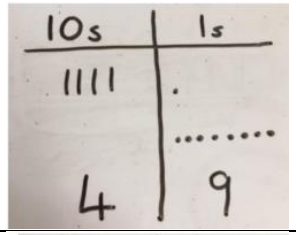
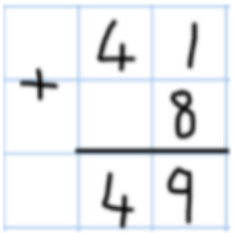
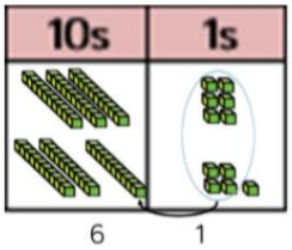
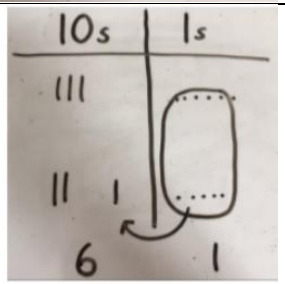
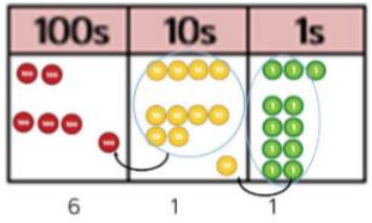
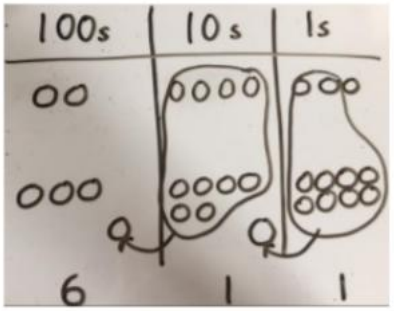
Remember: Concrete resources are not solely for use in EYFS and KS1. In KS2, concrete resources and pictorial representations should be used wherever possible when introducing a new strategy/concept to develop a secure understanding.

Addition (Vocab: sum, parts and wholes, plus, add, altogether, more, 'is equal to', 'is the same as')

Strategy	Concrete	Pictorial	Abstract
Combining two parts to make a whole Two parts are added together to make a whole		Part part whole model 	3 + 4 = 7 or 7 = 3 + 4 
Counting on Start with the larger number and count on	Using multilink:  Using a bead string: 	Using a number line:  Using a bar model: 	5 + 12 = 17 Start with larger number in head (12) and count on smaller number (5).
Regrouping to make 10 Start with the larger number and partition the smaller number to make up to 10.	Using tens frames or numicon 	Children draw tens frame and circles 	Children should develop an understanding of equality 6 + □ = 11 6 + 5 = 5 + □ 6 + 5 = □ + 4
Bar Model	Using multilink  5 + 5 = 10		

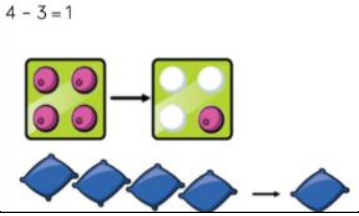
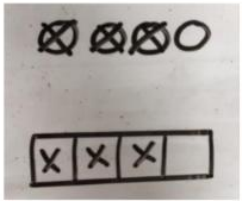
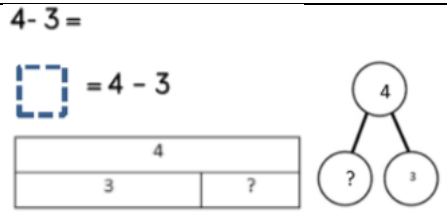
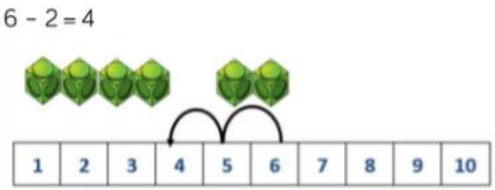
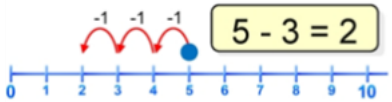
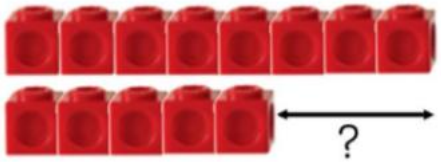
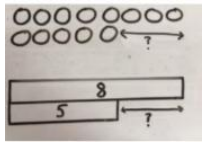
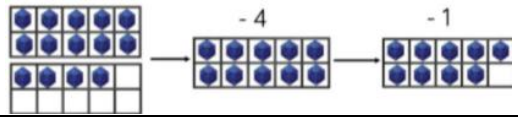
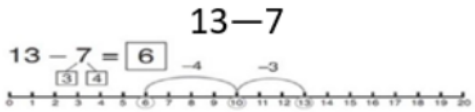
The above strategies should be embedded by the end of Year 1 and applied to larger numbers in Y2 and KS2.

Progression in formal written methods for addition (column addition):

Objective	Concrete	Pictorial	Abstract
TO + 0 **Tens and Ones + Ones** (Year 2 objective)	Using Base 10 41 + 8 	Drawing lines and dots to represent 10s and 1s 	
TO + T0 **Tens and Ones + Tens and Ones** (Year 2 objective)	Using Base 10 children can physically 'exchange' 10 Ones for a Ten 		36 +25 61 1
HTO + TO or HTO + HTO (Year 3 objective)	Using place value counters 10 tens are 'exchanged' for a hundred 		243 +368 611 1 1

The above method can be applied in Year 4, 5 and 6 with increasingly large numbers.

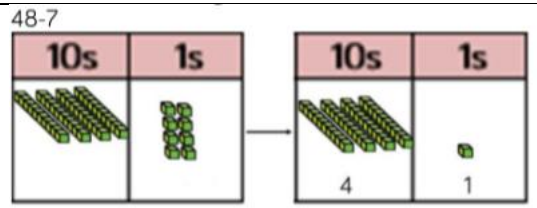
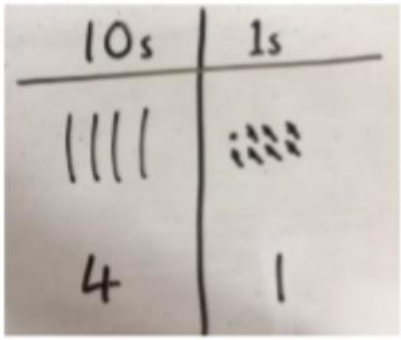
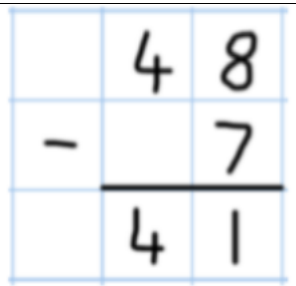
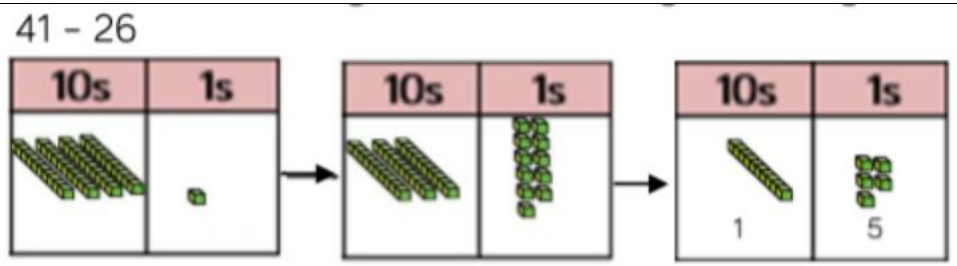
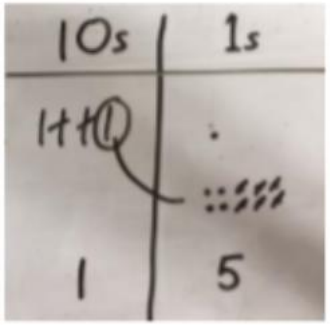
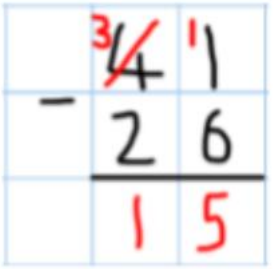
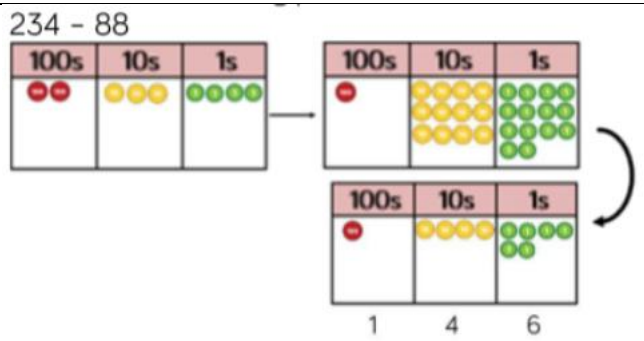
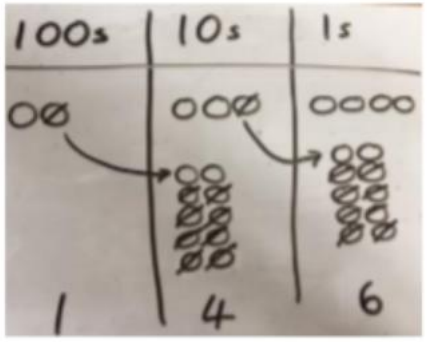
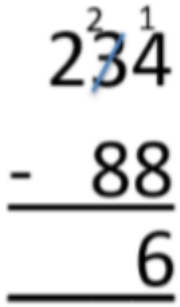
Subtraction **(Vocab: take away, less than, the difference, subtract, minus, fewer, decrease)**

Strategy	Concrete	Pictorial	Abstract
Taking away (removing objects from the whole)	Using numicon (ten frames) or objects like beanbags. 4 - 3 = 1 	Children draw pictures or a bar model. 	4- 3 = 
Counting back	Using multilink on a number line. 6 - 2 = 4 	Using a number line. 	13 – 4 = 9 Put 13 in your head and count back 4. What number are you at?
Finding the difference		Children draw pictures or a bar model. 	12 – 9 = 3 Start at the smaller number and count on until you get to the other number. What is the difference?
Making 10	Using tens frames. Partition 5 into 4 and 1. Subtract 4 to make 10 then subtract 1 from 10. 14 – 5 		14 – 8 = How many do we take away first to get 10? How many more need to be taken away?

The above strategies should be embedded by the end of Year 1 and applied to larger numbers in Y2 and KS2.

Progression in formal written methods for subtraction (column subtraction):

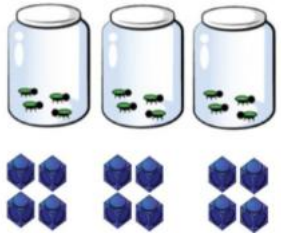
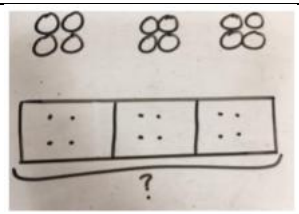
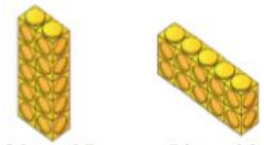
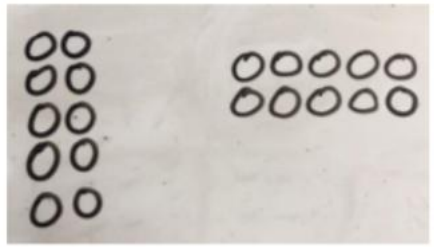
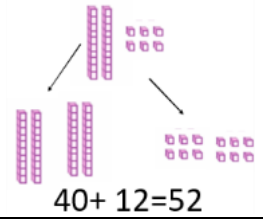
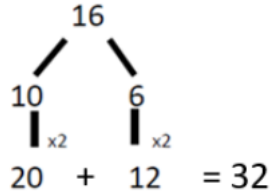
Objective	Concrete →	Pictorial →	Abstract

TO – O (Year 2 objective)			
TO – TO (Year 2 objective)	 Exchange a ten for 10 ones		
HTO – TO (Year 3 objective)			

The above method can be applied in Year 4, 5 and 6 with increasingly large numbers.

Multiplication **(Vocab: double, times, multiplied by, the product of, groups of, lots of, equal groups)**

Strategy	Concrete	Pictorial	Abstract

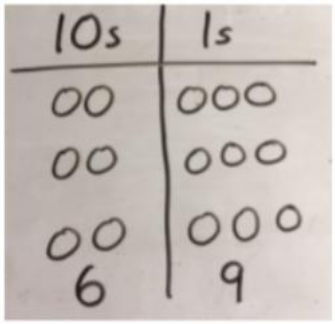
Repeated addition	3 x 4 is the same as 4 + 4 + 4 	 	3 x 4 = 12 4 + 4 + 4 = 12
Arrays	2 x 5 or 5 x 2  2 lots of 5 5 lots of 2 Counters and other objects can also be arranged in arrays.	Children can draw pictures in arrays. 	2 x 5 = 10 is the same as: 5 + 5 = 10 5 x 2 = 10 is the same as: 2 + 2 + 2 + 2+ 2 = 1-
Doubling	Using Base 10.  40+ 12=52	 16 10 6 x2 x2 20 + 12 = 32	Double 16 = 32 16 x 2 = 32

The above strategies should be embedded by the end of Year 2 and revisited in KS2 to support understanding of multiplying larger numbers.

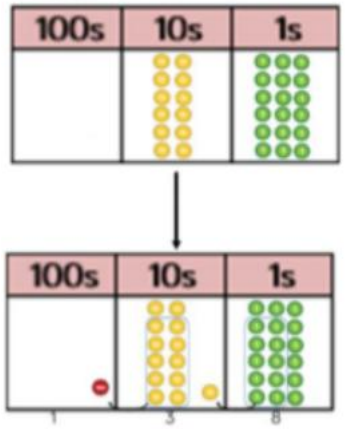
Progression in formal written methods for multiplication (short/long multiplication):

Objective	Concrete	Pictorial	Abstract

<table>
<tr>
<td>Short multiplication (no exchanging)

(Year 3 objective)</td>
<td>3 x 23 represented by place value counters (or base 10):
 
</td>
<td> 
</td>
<td>Children to record what it is they are doing to show understanding.
3 × 23
20 3
3 × 20 = 60
3 × 3 = 9
60 + 9 = 69

23
× 3
69</td>
</tr>
<tr>
<td>Short multiplication (exchanging)

(Year 4 objective)</td>
<td>6 x 23
 
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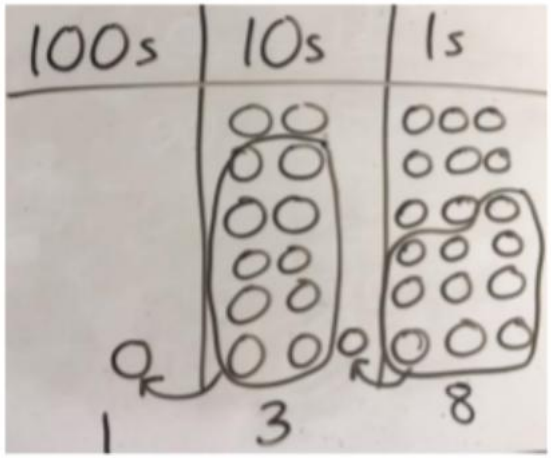
<td> 
</td>
<td>6 x 23 =

23
× 6
138
1 1</td>
</tr>
<tr>
<td>Long multiplication

(Year 5 objective)</td>
<td colspan="3">When children begin multiplying 2d x 2d or 3d x 2d they should already be confident with the abstract.

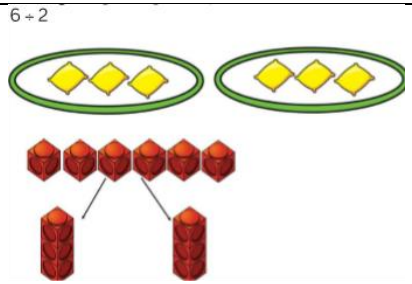
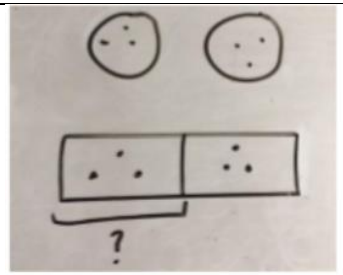
Step 1
TTh Th H T O
6 9 3
× 2 4
2 7 7 2 (693 x 4)

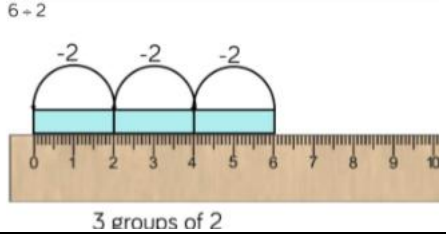
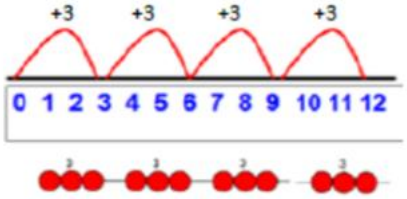
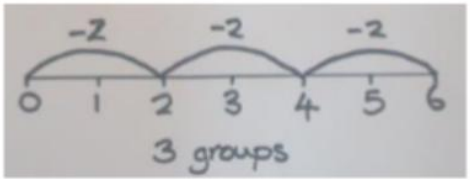
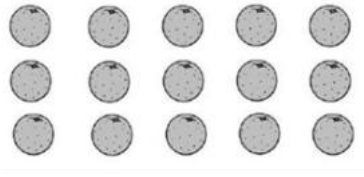
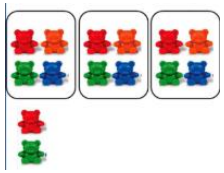
Step 2
TTh Th H T O
6 9 3
× 2 4
2 7 7 2 (693 x 4)
+ 1 3 8 6 0 (693 x 20)

Step 3
TTh Th H T O
6 9 3
× 2 4
2 7 7 2 (693 x 4)
+ 1 3 8 6 0 (693 x 20)
1 6 6 3 2</td>
</tr>
</table>

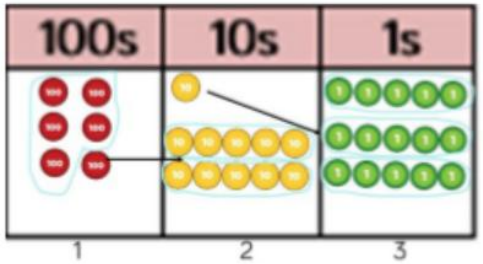
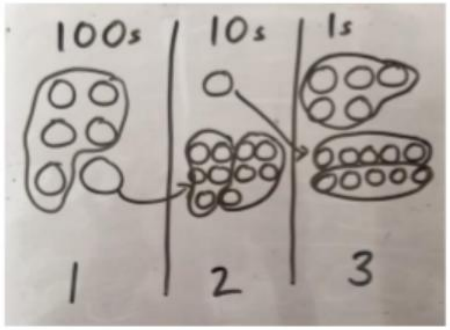
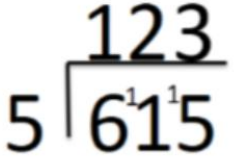
Multiplying decimals (Year 6 objective)	Expanded method: T O . t h 4 . 9 2 x 3 0 . 0 6 (0.02 x 3) 2 . 7 (0.9 x 3) + 1 2 (4 x 3) 1 4 . 7 6 Compact method: T O . t h 4 . 9 2 x 3 1 4 . 7 6 2

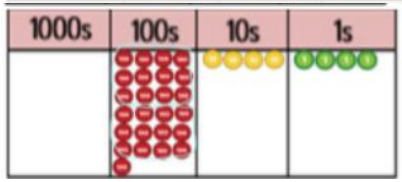
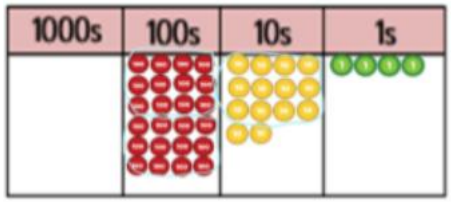
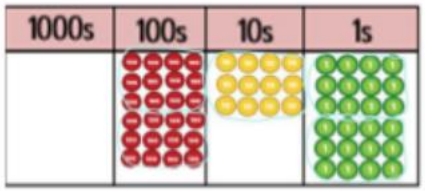
Division (Vocab: share, group, divide, divided by, half)

Strategy	Concrete →	Pictorial →	Abstract
Sharing			6 ÷ 2 = 3 3 | 3 Children should also be encouraged to use their 2 times tables facts.

Repeated subtraction	Using Cuisenaire rods above a ruler. 	Use a number line for grouping 	Use an abstract number line. 
Division with arrays	Link division with multiplication using arrays.  15 ÷ 5 = 3 3 x 5 = 15	Draw counters or pictures in arrays. 	Find the inverse of multiplication facts: 3 x 5 = 15 so 15 ÷5 = 3 and 15 ÷ 3 = 5
Division with remainders	14 ÷ 3= Divide objects between groups and see how much is left over. 		19 ÷ 4 = 4 r 3

Progression in formal written methods for division (short/long division):

Objective	Concrete	Pictorial	Abstract
Short division	615 ÷ 5 		

Long division	Step 1:  We can't group 2 thousands into groups of 12 so will exchange them.  We can group 24 hundreds into groups of 12 which leaves with 1 hundred. Step 2: 02 12 | 254 24 1 Step 3:  After exchanging the hundred, we have 14 tens. We can group 12 tens into a group of 12, which leaves 2 tens. 021 12 | 2544 24 14 12 2 Step 4:  After exchanging the 2 tens, we have 24 ones. We can group 24 ones into 2 group of 12, which leaves no remainder. 0212 12 | 2544 24 14 12 24 24 0